

STT055-P01

Room:Convention Hall

Time:May 27 10:30-13:00

An investigation of seismic noise level of borehole-type broadband seismometer CMG-3TB (2)

Takumi Koyama^{1*}, Naoya Mikami¹, Hiroyuki Takayama¹, Tomomichi Furudate¹

¹Matsushiro Seismological Observatory,JMA

The borehole type very broadband seismometer (Guralp Systems CMG-3TB) was installed in the 700m-deep borehole at Matsushiro Seismological Observatory (MSO) in 2008. Tsuyuki et al. (2009) investigated the noise level of this seismometer comparing with the STS-1 in the observation tunnel of MSO and found that the noise of CMG-3TB is smaller than STS-1 significantly for short period band (less than a few seconds). On the other hand, they found that the horizontal component of CMG-3TB showed fairly large noise with period of more than several minutes. They suggested that this long period noise could be reduced by installation method. Then, we reconsidered the sensor installation method, and re-installed the sensor near the bottom of borehole without the rubber seats for protection. As a result, long period noise has almost disappeared and observed data become stable. In this study, we again investigate the ground noise level of the CMG-3TB compared with other broadband seismometers installed at observation tunnel at MSO.

We compared the power spectra of CMG-3TB with STS-1 and STS-2, and found that the noise level of CMG-3TB is smaller than STS-1 and STS-2 for the period of less than 2-3 seconds especially remarkable at around the period of 0.5 seconds. We could reconfirm the effect of deep borehole installation for CMG-3TB. For the period of 2-100 seconds, the noise level is almost same for CMG-3TB and STS-1. For the period of 100-1000 seconds, we can see that the noise level of CMG-3TB is a little larger than that of STS-1, but this feature is not seen for components and analyzed periods. In addition, we confirmed that the records of tidal component were almost same for CMG-3TB and STS-1. Thus, it is considered that CMG-3TB has almost as same frequency characteristic as STS-1.

Keywords: Borehole-type broadband seismometer, noise level